

time series at an end time series before said second time among said segments having status of loading; and

means for reading data from said segments found in the seeking means.

REMARKS

Initially, in the Office Action dated August 28, 2001, the Examiner has rejected claims 21 and 22 under 35 USC §112 second paragraph. Further, claims 1-12, 14 and 16-20 have been rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 4,648,036 (Gallant) in view of U.S. Patent No. 5,623,639 (Yazaki et al.). Further, claims 21 and 22 have been rejected under 35 USC §103(a) as being unpatentable over Gallant in view of Yazaki et al. and further in view of U.S. Patent No. 5,933,820 (Beier et al.).

By the present response, Applicants have amended claims 1, 4, 7, 12, 14 and 19-22 to further clarify the invention. Claims 1-12, 14 and 16-22 remain pending in the present application.

35 USC §112 Rejections

Claims 21 and 22 have been rejected under 35 USC §112 second paragraph. Applicants have amended claims 21 and 22 to further clarify the invention and submit that these amended claims overcome the 35 USC §112 second paragraph rejections. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

35 USC §103 Rejections

Claims 1-12, 14 and 16-20 have been rejected under 35 USC §103(a) as being unpatentable over Gallant in view of Yazaki et al. Applicants respectfully traverse these rejections.

Regarding claims 1, 4, 7, 12, 14 and 20, Applicants submit that neither Gallant nor Yazaki et al., taken alone or in any proper combination, disclose, suggest or render obvious the limitations in the combination of each of these claims of, inter alia, a plurality of data areas, each of the plurality of data areas being loaded with data each for a constant time generated in a time series during a certain time where the plurality of data areas are managed by the time series, or bookmark information areas provided at predetermined locations at the plurality of data areas where each has a pair of bookmark information indicative of a time in which the data is loaded in a time series data piece for the constant time in each of the data areas and state transition information indicative of a state of the data piece in each data area. The Examiner asserts that “since the claimed plurality of data areas is being managed by the time series (see lines 4-5 of claim 1), it clearly reads on a plurality of tables storing changeable data in the system of Gallant (see Figs. 4-6)”.

Applicants fail to understand the Examiner’s reasoning in a plurality of data areas being managed by a time series relating to a plurality of tables storing changeable data. Gallant disclosing data stored in the tables (shown in Figs. 4-6 of Gallant) is not related to time at all, in contrast with the limitations in the claims of the present application. The tables in Figs. 4-6 of Gallant show data areas, however, these data areas have no information related at all to a constant time generated in a time series. Further, the tables 4-6 in Gallant contain data areas that are not managed

by a time series (since there is none) as recited in the claims of the present invention. The fact that data is changeable in Gallant suggests nothing related to data for a constant time or a time series.

Moreover, the Examiner asserts that "since the bookmark information areas are provided at predetermined locations (in the claims of the present application) they merely read on the code field and key field identifying the state of the data in the data structure of Gallant (see col. 2, lines 21-59)". The bookmark information according to the present invention relates to a time at which data is loaded (e.g., time stamp) and state transition information which indicates either an online state or a loading state. In contrast, the code field in Gallant is simply a value (i.e., 0, 1, 2) denoting whether the associated data should stay as it is, is updated data, or data to be erased. This is not time stamp related data as recited in the claims of the present application. Further, the key field in Gallant contains relevant search parameters for a given table. This is not time stamp related information or status related information as recited in the claims of the present application.

The Examiner further asserts that Yazaki et al. was cited merely to show that it is well known in the art to keep track of time-ordered data items. However, Applicants assert that Yazaki et al. merely relates to the management of a memory unit based on signals received from a time measuring unit that includes a time measuring table. The term "time-series data" in Yazaki et al. appears to relate to data such as animated images and sound data (see Field of Invention, col. 1, lines 22-30). In contrast, time series data according to the present invention relates to data which has time related (i.e., time stamped) information along with the data. This is not disclosed or suggested in Yazaki et al.

Regarding claims 2, 3, 5, 6, 8-11 and 16-19, Applicants submit that these claims are dependent on one of the independent claims 1, 4, 7 and 14 and, therefore, are patentable at least for the same reasons noted previously regarding these independent claims.

Accordingly, Applicants submit that neither Gallant nor Yazaki et al. disclose, suggest or render obvious the limitations in the combination in each of claims 1-12, 14 and 16-20 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

Claims 21 and 22 have been rejected under 35 USC §103(a) as being unpatentable over Gallant in view of Yazaki et al. and further in view of Beier et al. Applicants respectfully traverse this rejection, and submit that these claims are patentable over the cited references, taken alone or in any proper combination, due to the significant defects noted previously regarding the Gallant and Yazaki et al. references. Beier et al. discloses reorganization in a database management. Direct and indirect pointing to locate targeted data elements that are logically related to another data element or are a target of a secondary index are used internally by the database management system. Applicants submit that neither Gallant, Yazaki et al., nor Beier et al., taken alone or in any proper combination, disclose, suggest or render obvious the limitations in the combination of each of these claims of, inter alia, pointing, in response to a retrieval request requesting data for a constant time in a time series between a first time and a second time, to a segment of a database which stores a data oldest in time series between the first time and the second time, or acquiring time information from a bookmark to obtain status information to determine whether said status information indicates a state of loading of data in the

database. As discussed previously, neither Gallant nor Yazaki et al. disclose, suggest or render obvious bookmarks, as recited in the claims of the present application, that include status information. Further, as asserted previously, none of the cited references relate to data of a time series. Applicants assert that Beier et al. does not disclose, suggest, or render obvious anything to overcome the defects of the previously cited references of Gallant and Yazaki et al. Gallant storing a changeable database, or Yazaki et al. using the term "time series data" to refer to animated images and sound data, does not relate to, disclose or render obvious the limitations in the combination of each of the claims of the present application. Further, as noted previously, the code fields and key fields of Gallant do not relate to the bookmark information as recited in the claims of the present application.

Accordingly, Applicants submit that none of the cited references, taken alone or in any proper combination, disclose, suggest or render obvious the limitations in the combination of claims 21 and 22 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-12, 14 and 16-22 are now in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

Any amendments to the claims which have been made in this Amendment and which have not been specifically noted to overcome a rejection based upon the prior art should be considered to have been made for a purpose unrelated to patentability and no estoppel should be deemed to attach thereto.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The attached page is captioned "**Version with markings to show changes made.**"

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees or credit any overpayment of fees to the deposit account of Antonelli, Terry, Stout & Kraus, LLP., Deposit Account No. 01-2135 (referencing case No. 500.36133CX1).

Respectfully submitted,



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Version with markings to show changes made

Please amend the claims as follows:

1. (Five Times Amended) A data structure, stored on a storage medium, in a database, comprising:

a plurality of data areas, each of said plurality of data areas being loaded with data each for a constant time generated in time series during a certain time, the plurality of data areas being managed by the time series; and

bookmark information areas respectively provided at predetermined locations in said plurality of data areas, each having a pair of bookmark information indicative of a time at which said data is loaded in a time series data piece for said constant time in each of said data areas and state transition information indicative of a state of the data piece in said each data area, said state transition information being allowed to have one of a value indicative of an online state in which the data area is permitted to be retrieved and a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved.

4. (Five Times Amended) A data structure, stored on a storage medium, in a database, comprising:

a plurality of data areas in which given time series data pieces each for a constant time are loaded at predetermined locations, respectively, in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

predetermined bookmark information areas each having a pair of bookmark information indicative of a time at which said data is loaded in a time series data piece in each of said data areas and state transition information indicative of a state of the data piece in each data area, said state transition information having one of a value indicative of an online state in which the data area is permitted to be retrieved and a value indicative of a loading state in which loading of data in each data area has not yet been completed and the data area is not permitted to be retrieved.

7. (Five Times Amended) A database managing method for managing data in a database, comprising:

adding, to a predetermined location in a given time series data piece for a predetermined constant time, bookmark information having bookmark information indicative of a time at which said data is loaded in a time series data piece for said predetermined constant time for said predetermined time and state transition information indicative of a state of said time series data piece for said predetermined constant time;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty; and

loading time series data pieces for predetermined constant times in a plurality of data areas in said database, each of said plurality of data areas being loaded with

data generated in time series during a certain time, the plurality of data areas being managed by the time series.

12. (Five Times Amended) A database managing method for managing data in a database, comprising:

adding, to a predetermined location in a given time series data piece for a predetermined constant time, bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for said predetermined constant time and state transition information indicative of a state of said time series data piece for said predetermined constant time and start area information having a flag indicating whether the area is the final one of a plurality of areas in said database and an address area for setting an address;

providing, as said state transition information, one of a value indicative of an online state in which the data area is permitted to be retrieved and a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved;

loading time series data pieces for predetermined constant times in a plurality of consecutive data areas in said database, each of said plurality of consecutive data areas being loaded with data generated in time series during a certain time, the plurality of consecutive data areas being managed by the time series; and

raising said flag of start area information in the final one of said plurality of consecutive data areas and setting an address of first one of said plurality of consecutive data areas in said address area.

14. (Five Times Amended) A database managing method for managing data in a database, comprising:

reading bookmark information having bookmark information indicative of a time at which data is loaded in a time series data piece for a predetermined constant time and state transition information indicative of a state of said time series data piece for said predetermined constant time from a predetermined bookmark area and setting the state of said time series data piece in said state transition information to a value indicative of a state in which data is empty so as to write said bookmark information in said database; and

loading given time series data pieces for given predetermined constant times in a plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series; and

writing bookmark information having bookmark information indicative of a time corresponding to a time series data piece for said predetermined constant time and state transition information indicative of an online state of said time series data piece for said predetermined time in said predetermined bookmark area.

19. (Five Times Amended) A database managing method according to claim 14, further comprising:

cumulating repeatedly applied time series data pieces in a cumulative storage area until the cumulative data reach total data for said predetermined constant time; and

adding, to a data piece in said cumulative data storage area, bookmark information having bookmark information indicative of a time at which said data is loaded in said data piece for said predetermined constant time and state transition information indicate of a state of said time series data piece for said predetermined constant time and loading resulting data pieces in said plurality of data areas in said database, each of said plurality of data areas being loaded with data generated in time series during a certain time, the plurality of data areas being managed by the time series.

20. (Four Times Amended) A database managing system, comprising:

a processor having a memory for storing data for a certain time and a clock for reading times at which said data are applied, the data in the memory being managed by time series; and

a database connected to said processor and having bookmark information indicative of a time at which said data is loaded in a time series data piece for a predetermined constant time, state transition information indicative of a state of said time series data piece of said predetermined constant time and said time series data pieces for said predetermined constant times, said state transition information having one of a value indicative of an online state in which the data area is permitted to be retrieved, a value indicative of a loading state in which loading of data in the data area has not yet been completed and the data area is not permitted to be retrieved and a value indicative of a state in which data in the data area is empty.

21. (Amended) A data base managing method for managing data in a database comprising the steps of:

[pointing to a segment of a database which stores a data most oldest in time series based on a retrieval request requesting data of time series between a first time and a second time;]

pointing, in response to a retrieval request requesting data for a constant time in time series between a first time and a second time, to a segment of a database which stores a data oldest in time series between said first time and said second time;

acquiring time information from a bookmark residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in said database;

seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

reading data from said segments found in the seeking step.

22. (Amended) A database managing system comprising:

[means for pointing a segment of a database which stores a data most oldest in time series based on a retrieval request requesting data of time series between a first time and a second time;]

means, in response to a retrieval request requesting data for a constant time in time series between a first time and a second time, for pointing a segment of a

database which stores a data oldest in time series between said first time and said second time;

means for acquiring time information from a bookmark residing at a predetermined position of said segment to obtain status information to determine whether said status information indicates a state of loading of data in said database;

means for seeking succeeding segments to find segments of time series after said first time based on bookmarks of said succeeding segments until a segment of time series at an end time series before said second time among said segments having status of loading; and

means for reading data from said segments found in the seeking means.